



**National Voluntary  
Laboratory Accreditation Program**



**CALIBRATION LABORATORIES**

**NVLAP LAB CODE 200495-0**

**SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005**

<b>North Carolina Standards Laboratory</b> 4040 District Drive / 1051 Mail Service Center Raleigh, NC 27699-1051 Ms. Sharon Woodard Phone: 919-733-4411 x213 Fax: 919-733-8804 E-mail: <a href="mailto:sharon.woodard@ncagr.gov">sharon.woodard@ncagr.gov</a> URL: <a href="http://www.ncagr.gov/standard">http://www.ncagr.gov/standard</a>	<b>Fields of Calibration</b> Dimensional Mechanical Thermodynamic  This laboratory is compliant to ANSI/NCSL Z540-1-1994; Part 1. (20/A01)
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**CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2**

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty <small>Note 3</small>	Remarks
<b>DIMENSIONAL</b>			
<b>LENGTH and DIAMETER, STEP GAGES (20/D05)</b>			
Lottery Ball Pass Through Gauge	Dimensions	7.5 $\mu$ in	
<b>MECHANICAL</b>			
<b>MASS DETERMINATION (20/M08)</b>			
Metric	30 kg 25 kg 20 kg 10 kg 5 kg 3 kg 2 kg 1 kg 500 g 300 g 200 g 100 g 50 g 30 g 20 g 10 g 5 g 3 g	9.3 mg 9.0 mg 6.5 mg 4.4 mg 0.65 mg 0.40 mg 0.29 mg 62 $\mu$ g 47 $\mu$ g 36 $\mu$ g 32 $\mu$ g 35 $\mu$ g 18 $\mu$ g 11 $\mu$ g 7.6 $\mu$ g 4.9 $\mu$ g 2.5 $\mu$ g 1.6 $\mu$ g	Echelon I

2018-02-26 through 2019-03-31

*Effective dates*

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### CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty <small>Note 3</small>	Remarks
Avoirdupois	2 g	1.2 µg	
	1 g	1.0 µg	
	500 mg	0.70 µg	
	300 mg	0.56 µg	
	200 mg	0.52 µg	
	100 mg	0.57 µg	
	50 mg	0.41 µg	
	30 mg	0.34 µg	
	20 mg	0.32 µg	
	10 mg	0.37 µg	
	5 mg	0.24 µg	
	3 mg	0.20 µg	
	2 mg	0.18 µg	
	1 mg	0.20 µg	
	50 lb	17 mg	
	30 lb	11 mg	
	25 lb	10 mg	
	20 lb	7.6 mg	
	10 lb	4.8 mg	
	5 lb	0.50 mg	
	4 lb	0.48 mg	
	3 lb	0.37 mg	
	2 lb	0.079 mg	
	1 lb	0.066 mg	
	0.5 lb	0.11 mg	
	0.3 lb	0.099 mg	
	0.2 lb	0.10 mg	
	0.1 lb	0.12 mg	
	0.05 lb	58 µg	
	0.03 lb	35 µg	
	0.02 lb	23 µg	
	0.01 lb	12 µg	
	0.005 lb	6.0 µg	
	0.003 lb	3.8 µg	
	0.002 lb	2.7 µg	

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### CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty <small>Note 3</small>	Remarks
Metric	0.001 lb	2.0 µg	
	250 kg	2.7 g	Echelon II
	200 kg	2.2 g	
	100 kg	0.77 g	
	30 kg	9.3 mg	
	25 kg	9.0 mg	
	20 kg	6.5 mg	
	10 kg	4.4 mg	
	5 kg	0.65 mg	
	3 kg	0.40 mg	
	2 kg	0.29 mg	
	1 kg	62 µg	
	500 g	47 µg	
	300 g	36 µg	
	200 g	32 µg	
	100 g	35 µg	
	50 g	18 µg	
	30 g	11 µg	
	20 g	7.6 µg	
	10 g	4.9 µg	
	5 g	2.5 µg	
	3 g	1.6 µg	
	2 g	1.2 µg	
	1 g	1.0 µg	
	500 mg	0.70 µg	
	300 mg	0.56 µg	
	200 mg	0.52 µg	
	100 mg	0.57 µg	
	50 mg	0.41 µg	
	30 mg	0.34 µg	
	20 mg	0.32 µg	
	10 mg	0.37 µg	
	5 mg	0.24 µg	
	3 mg	0.20 µg	
	2 mg	0.18 µg	

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## CALIBRATION LABORATORIES

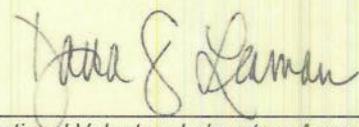
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### CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty <small>Note 3</small>	Remarks
Avoirdupois	1 mg	0.20 µg	
	2500 lb	19 g	
	1000 lb	1.8 g	
	500 lb	0.79 g	
	100 lb	72 mg	
	50 lb	17 mg	
	30 lb	11 mg	
	25 lb	10 mg	
	20 lb	7.6 mg	
	10 lb	4.8 mg	
	5 lb	0.50 mg	
	4 lb	0.48 mg	
	3 lb	0.37 mg	
	2 lb	0.079 mg	
	1 lb	0.066 mg	
	0.5 lb	0.11 mg	
	0.3 lb	0.099 mg	
	0.2 lb	0.10 mg	
	0.1 lb	0.12 mg	
	0.05 lb	58 µg	
	0.03 lb	35 µg	
	0.02 lb	23 µg	
	0.01 lb	12 µg	
Metric	0.005 lb	6.0 µg	
	0.003 lb	3.8 µg	
	0.002 lb	2.7 µg	
	0.001 lb	2.0 µg	
	1000 kg	20 g	Echelon III
	500 kg	6.0 g	
	250 kg	3.2 g	
	200 kg	2.7 g	
	100 kg	1.4 g	
	50 kg	0.30 g	
	30 kg	0.18 g	

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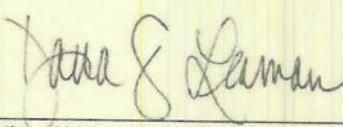
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### CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty <small>Note 3</small>	Remarks
	25 kg	0.15 g	
	20 kg	0.12 g	
	10 kg	66 mg	
	5 kg	30 mg	
	3 kg	18 mg	
	2 kg	12 mg	
	1 kg	7.1 mg	
	500 g	5.0 mg	
	300 g	4.6 mg	
	200 g	1.2 mg	
	100 g	0.60 mg	
	50 g	0.36 mg	
	30 g	0.48 mg	
	20 g	0.31 mg	
	10 g	0.25 mg	
	5 g	0.17 mg	
	3 g	0.11 mg	
	2 g	89 µg	
	1 g	60 µg	
	500 mg	45 µg	
	300 mg	36 µg	
	200 mg	31 µg	
	100 mg	24 µg	
	50 mg	19 µg	
	30 mg	17 µg	
	20 mg	15 µg	
	10 mg	12 µg	
	5 mg	9.9 µg	
	3 mg	8.8 µg	
	2 mg	7.6 µg	
	1 mg	6.5 µg	
Lottery Balls	Dimensions	45 mg	Echelon III
Avoirdupois	2500 lb 2000 lb	34 g 20 g	Echelon III

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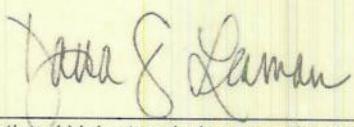
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### CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty <small>Note 3</small>	Remarks
	1000 lb	5.2 g	
	500 lb	1.9 g	
	100 lb	0.28 g	
	50 lb	0.14 g	
	30 lb	88 mg	
	25 lb	76 mg	
	20 lb	62 mg	
	10 lb	29 mg	
	5 lb	14 mg	
	4 lb	11 mg	
	3 lb	9.0 mg	
	2 lb	6.7 mg	
	1 lb	5.1 mg	
	0.5 lb	4.6 mg	
	0.3 lb	1.7 mg	
	0.2 lb	1.5 mg	
	0.1 lb	1.6 mg	
	0.05 lb	0.82 mg	
	0.03 lb	0.51 mg	
	0.02 lb	0.37 mg	
	0.01 lb	0.23 mg	
	0.005 lb	0.20 mg	
	0.003 lb	0.12 mg	
	0.002 lb	87 µg	
	0.001 lb	56 µg	
	4 oz	1.1 mg	
	2 oz	0.65 mg	
	1 oz	0.39 mg	
	1/2 oz	0.28 mg	
	1/4 oz	0.18 mg	
	1/8 oz	0.13 mg	
	1/16 oz	87 µg	
	1/32 oz	60 µg	
Weight Carts	6000 lb	130 g	Echelon III

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### CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty <small>Note 3</small>	Remarks
	5500 lb	94 g	
	5000 lb	94 g	
	4500 lb	82 g	
	4000 lb	76 g	
	3000 lb	64 g	
<b>VOLUME and DENSITY (20/M12)</b>			
Volume	2000 gal	98 in <sup>3</sup>	Transfer Method
	1500 gal	74 in <sup>3</sup>	
	1200 gal	52 in <sup>3</sup>	
	1000 gal	49 in <sup>3</sup>	
	500 gal	29 in <sup>3</sup>	
	200 gal	6.3 in <sup>3</sup>	
	100 gal	2.7 in <sup>3</sup>	
	60 gal	1.2 in <sup>3</sup>	
	50 gal	0.91 in <sup>3</sup>	
	25 gal	0.76 in <sup>3</sup>	
	15 gal	0.51 in <sup>3</sup>	
	10 gal	0.38 in <sup>3</sup>	
	5 gal	0.29 in <sup>3</sup>	4 in neck
	5 gal	0.45 in <sup>3</sup>	3 in neck
	650 L	3.3 in <sup>3</sup>	
	500 L	4.5 in <sup>3</sup>	
	40 L	0.66 in <sup>3</sup>	
	20 L	0.24 in <sup>3</sup>	
Volume	500 gal	37 in <sup>3</sup>	LPG Transfer Method
	110 gal	5.0 in <sup>3</sup>	
	104 gal	5.5 in <sup>3</sup>	
	103 gal	5.7 in <sup>3</sup>	
	100 gal	4.9 in <sup>3</sup>	
	50 gal	3.1 in <sup>3</sup>	
	25 gal	2.2 in <sup>3</sup>	
	24 gal	3.3 in <sup>3</sup>	

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Measured Parameter or Device Calibrated	Range	Expanded Uncertainty <small>Note 3</small>	Remarks
	100 gal	3.0 in <sup>3</sup>	
	75 gal	2.3 in <sup>3</sup>	
	50 gal	0.59 in <sup>3</sup>	
	25 gal	0.47 in <sup>3</sup>	
	20 gal	0.39 in <sup>3</sup>	
	15 gal	0.33 in <sup>3</sup>	
	10 gal	0.35 in <sup>3</sup>	
Test Measure	5 gal	0.16 in <sup>3</sup>	4 in neck
	5 gal	0.14 in <sup>3</sup>	3 in neck
	5 gal	0.096 in <sup>3</sup>	2 in neck
	10 ft <sup>3</sup>	1.5 in <sup>3</sup>	
	0.5 ft <sup>3</sup>	0.044 in <sup>3</sup>	
	20 L	2.6 mL	
Prover	400 L	24 mL	
	100 L	6.2 mL	
Flask	100 mL	0.038 mL	
	1 qt	0.18 mL	
	1 gill	0.042 mL	
Slicker Standard	100 gal	0.76 in <sup>3</sup>	
	50 gal	0.55 in <sup>3</sup>	
	25 gal	0.37 in <sup>3</sup>	
	15 gal	0.17 in <sup>3</sup>	
	5 gal	0.16 in <sup>3</sup>	
	1 gal	0.020 in <sup>3</sup>	
	1.0 ft <sup>3</sup>	0.13 in <sup>3</sup>	
	20 L	1.1 mL	
	10 L	1.6 mL	
	5 L	0.83 mL	
Small Volume Prover	30 gal	1.5 in <sup>3</sup>	Gravimetric Method

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### CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty <small>Note 3</small>	Remarks
	20 gal	0.71 in <sup>3</sup>	
	15 gal	0.59 in <sup>3</sup>	
	5 gal	0.27 in <sup>3</sup>	
<b>THERMODYNAMIC</b>			
<b>LABORATORY THERMOMETERS, DIGITAL AND ANALOG (20/T03)</b>			
Liquid in Glass and Digital	-30 °C to 95 °C 95 °C to 230 °C  -22 °F to 203 °F 203 °F to 446 °F	0.012 °C 0.038 °C  0.021 °F 0.068 °F	Comparison to PRT  Comparison to PRT
<b>RESISTANCE THERMOMETRY (20/T07)</b>			
	-30 °C to 95 °C 95 °C to 230 °C  -22 °F to 203 °F 203 °F to 446 °F	0.0081 °C 0.024 °C  0.015 °F 0.043 °F	Comparison  Comparison
END			

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### Notes

**Note 1:** A Calibration and Measurement Capability (CMC) is a description of the best result of a calibration or measurement (result with the smallest uncertainty of measurement) that is available to the laboratory's customers under normal conditions, when performing more or less routine calibrations of nearly ideal measurement standards or instruments. The CMC is described in the laboratory's scope of accreditation by: the measurement parameter/device being calibrated, the measurement range, the uncertainty associated with that range (see note 3), and remarks on additional parameters, if applicable.

**Note 2:** Calibration and Measurement Capabilities are traceable to the national measurement standards of the U.S. or to the national measurement standards of other countries and are thus traceable to the internationally accepted representation of the appropriate SI (Système International) unit.

**Note 3:** The uncertainty associated with a measurement in a CMC is an expanded uncertainty with a level of confidence of approximately 95 %, typically using a coverage factor of  $k = 2$ . However, laboratories may report a coverage factor different than  $k = 2$  to achieve the 95 % level of confidence. Units for the measurand and its uncertainty are to match. Exceptions to this occur when marketplace practice employs mixed units, such as when the artifact to be measured is labeled in non-SI units and the uncertainty is given in SI units (Example: 5 lb weight with uncertainty given in mg).

**Note 3a:** The uncertainty of a specific calibration by the laboratory may be greater than the uncertainty in the CMC due to the condition and behavior of the customer's device and specific circumstances of the calibration. The uncertainties quoted do not include possible effects on the calibrated device of transportation, long term stability, or intended use.

**Note 3b:** As the CMC represents the best measurement results achievable under normal conditions, the accredited calibration laboratory shall not report smaller uncertainty of measurement than that given in a CMC for calibrations or measurements covered by that CMC.

**Note 3c:** As described in Note 1, CMCs cover calibrations and measurements that are available to the laboratory's customers under *normal conditions*. However, the laboratory may have the capability to offer special tests, employing special conditions, which yield calibration or measurement results with lower uncertainties. Such special tests are not covered by the CMCs and are outside the laboratory's scope of accreditation. In this case, NVLAP requirements for the labeling, on calibration reports, of results outside the laboratory's scope of accreditation apply. These requirements are set out in Annex A.1.h. of NIST Handbook 150, Procedures and General Requirements.

**Note 4:** Uncertainties associated with field service calibration may be greater as they incorporate on-site environmental contributions, transportation effects, or other factors that affect the measurements. (This note applies only if marked in the body of the scope.)

**Note 5:** Values listed with percent (%) are percent of reading or generated value unless otherwise noted.

**Note 6:** NVLAP accreditation is the formal recognition of specific calibration capabilities. Neither NVLAP nor NIST guarantee the accuracy of individual calibrations made by accredited laboratories.

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